

new planet was detected by its appearance and not by its motion." Herschel, referring to his discovery in his communication to Lichtenberg, says: "This was by no means the result of chance, but a simple consequence of the position of the planet on that particular evening, since it occupied precisely that spot in the heavens which came in the order of the minute observations that I had previously mapped out for myself. Had I not seen it just when I did I must inevitably have come upon it soon after, since my telescope was so perfect that I was able to distinguish it from a fixed star in the first minute of observation." It is not to be supposed that so striking an object would have been viewed once and forgotten, even if no motion were immediately detected.

As is well known, Herschel, feeling deeply his indebtedness to the liberality of George the Third, desired to testify his gratitude by giving his planet a name which would mark the epoch of its discovery, and in his letter on the subject addressed to Sir Joseph Banks, then president of the Royal Society, writes, "I cannot but wish to take this opportunity of expressing my sense of gratitude by giving the name Georgium Sidus,

Georgium Sidus

—*jam nunc assuesce vocari,*

to a star, which (with respect to us) first began to shine under his auspicious reign."

Prof. Holden dwells upon the changes which may be considered to have been effected in the state of astronomy not only in England but in the whole world, simply by the discovery of Uranus. "Herschel's researches would have gone into the *Philosophical Transactions* as the work of an amateur astronomer, Mr. Herschel, of Bath. They would have been praised and they would have been doubted. It would have taken a whole generation to have appreciated them. They would have been severely tried, entirely on their merits, and finally they would have stood where they stand to-day—unrivalled. But through what increased labours these successes would have been gained! . . . Certainly, if Herschel's mind had been other than it was, the discovery of Uranus, which brought him honours from every scientific society in the world, and which gave him authority, might have had a hurtful effect. But as he was, there was nothing which could have aided his career more than this startling discovery. It was needed for him. It completed the solar system far more by affording a free play to a profoundly philosophical mind, than by occupying the vacant spaces beyond Saturn. His opportunities would have been profoundly modified, though his personal worth would have been the same." We think there are few astronomers who will not be able to follow Prof. Holden in the views he has thus forcibly expressed.

At the hands of Sir Joseph Banks, Herschel received the Copley Medal of the Royal Society in 1781, for his "discovery of a new and singular star," and was formally admitted a Fellow of the Society on May 30, 1782. It was during this visit to London that Herschel was received by the king, and as he wrote to his sister the same day, met with a very gracious reception. Prof. Holden reproduces from the *Memoirs of Caroline Herschel* his letter of July 3, in which he describes his visit to the Court with a 7-feet reflector, and the evening having been very fine, how the instrument had given

general satisfaction; the king in particular, he states, "enjoys observations with telescopes exceedingly." Herschel returned to Bath in the last week of July, and immediately prepared for removing to Datchet.

Here, at the end of his second chapter, we close our present notice of Prof. Holden's welcome volume, reserving for another week his third chapter on "Life at Datchet, Clay Hall, and Slough," and the concluding one on the general scientific labours of Herschel. It should be stated that while taking Prof. Holden's work as our text, particulars have been included in this notice which are not specially referred to in it, in view of the interest attaching to them at the present time, when, as stated above, a hundred years have elapsed since Herschel's discovery of *Uranus* doubled the known extent of the planetary system.

J. R. HIND

EXTINCT BRITISH ANIMALS

British Animals Extinct within Historic Times; with some Account of British Wild White Cattle. By J. E. Harting, F.L.S. (London: Trübner, 1880.)

THE wild animals formerly inhabiting Britain, which disappeared before the advance of the hunter and farmer in historic times, have hitherto only been treated in a disconnected fashion, in essays scattered through various periodicals, or in portions of books relating to other subjects. Mr. Harting has collected together in the present volume his own essays in the *Field* and in the *Popular Science Review*, and has brought to bear upon his subject a knowledge of records, and an acquaintance with sport, which render his work extremely valuable. His references are accurate, and he has availed himself of nearly every source of information. Consequently we have before us a work dealing with the bear, wolf, beaver, reindeer, and "wild cattle," worthy to be classed between Bell's "British Quadrupeds" on the one hand, and White's "History of Selborne" on the other, relating not merely to the animals, but to the forests in which they lived and to the mode in which they were hunted.

The common brown bear made its appearance on the Continent in the Pleistocene age, and crossed over to Britain while the areas of the North Sea and of the English Channel were fertile valleys abounding in animal life. Its remains occur both in the river-deposits and in the caves, and have been met with in the turbaries and alluvia of England and of Scotland, which belong to the prehistoric period. It was hunted by the Neolithic inhabitants of Britain, and used for food by the inhabitants of Colchester and Richmond in Roman times. From the "Penitentiale" of Archbishop Egbert (A.D. 750), in which the flesh of any animal torn by dog, wolf, fox, or bear, or any other wild animal is forbidden to be used for human food, it is clear that it was alive in this country at that time. In the days of Edward the Confessor Norwich furnished annually one bear to the king and six dogs for the baiting of it. This however does not prove the existence of wild bears in Britain at that date, because bear-baiting was almost a national sport among the English until bears became too costly and the public taste too refined for such brutal exhibitions. Fitz-Stephen tells us, in the reign of Henry II., that the young Londoners amused themselves in the forenoon of every holiday in the winter

season with boar-fights, or bull- and bear-baiting. A grand exhibition of bear-baiting took place at Hatfield House when Queen Mary visited her sister, the Princess Elizabeth, during her confinement there, "with which their Highnesses were right well content." Soon after the ascension of the latter to the throne she entertained the Spanish ambassadors with bulls and bears, and some years afterwards she received the Danish ambassador at Greenwich, and entertained him with bear-baiting, "tempered with other merry disports." On one occasion at Kenilworth no less than thirteen bears were baited before the queen with large ban-dogs. From these notices it is evident that Queen Elizabeth was very fond of this sport. Some of the great nobles and ecclesiastics also kept bears and bear-wards. Latterly there were travelling bear-wards dependent upon their patrons. The bear was probably extinct in Britain about the time of the Norman Conquest, and is not known to have existed in Ireland within the historic period.

The wolf abounded in Britain in the Pleistocene and prehistoric periods, and varied in numbers in the historic age in proportion to the waste lands. It was a subject of many legal enactments, and grants of land were held for its capture. To the numerous references which Mr. Harting gives we may add an extract from the Litany of Dunkeld current in Scotland in the eleventh or twelfth century: "A ceteranis et latronibus, a lupis et omni mala bestia, Domine, libera nos."

The animal had a price set upon its head by statute in 1621; the price paid for one wolf in Sutherlandshire was six pounds, thirteen shillings, and fourpence. In Ireland, in 1683, "for every bitch wolfe the price was six pounds, for every dog wolfe five pounds, for every cubb which preyeth for himself forty shillings, and for every suckling cubb ten shillings." It is obvious from these large prices that the wolf was becoming rare in Scotland and Ireland in the middle of the seventeenth century. The last of the British wolves was killed in Scotland in 1743 by MacQueen, a man remarkable for his stature and courage, who died in the year 1797. The memory of the exploit is still preserved by tradition. In Ireland the animal lingered until 1770. Mr. Harting deserves great credit for having collected together the evidence by which these dates can be fixed. The wolf became extinct in England in the reign of Henry VII.

The wild boar still lingered in Lancashire in 1617, and the last notice of the animal in the south of England is of the hunting of the wild boar at Windsor by James I. and his court. Mr. Harting considers that an entry in an account book of the steward of the manor of Chartley "1683.—February. Pd. the cooper for a paile for ye wild swine, o. 2. o." proves that it was not extinct in England at that date. It seems however to us very unlikely that wild boars would have such attention paid to their wants, and more probable that they were domestic swine turned out into the woodlands to get the greater part of their own living.

The reindeer, so abundant in the late Pleistocene age, and so generally found along with Palæolithic implements, and so strangely associated with the remains of hippopotamus in the hyæna-dens of this country (a fact which proves the two animals to have been contemporaneous), was rare in the prehistoric period, and disappeared alto-

gether from its last foothold in Caithness about the latter half of the thirteenth century. We may remark that the recent attempts to introduce the animal into Switzerland have failed, apparently from the great heat of summer.

The beaver was living in the River Teivi, according to Girald du Barry, in 1159; and, according to Boethius, was taken in Lochness for the sake of its fur towards the end of the fifteenth century. We would call the attention of our readers to the remarkably interesting account of its reintroduction by the Marquis into the Island of Bute, where they are now increasing rapidly and building their dams. There is evidently no difficulty in naturalising them in this country.

We close this review regretting that it is impossible to do justice to the careful account of the different breeds of the "wild white cattle," which we believe to be the descendants of the domestic cattle introduced by the English, and which have always lived in uninclosed lands.

W. BOYD DAWKINS

OUR BOOK SHELF

Notes of Observations of Injurious Insects. Report, 1880. By Eleanor A. Ormerod. 8vo. pp. 1-48. (London: W. Swan Sonnenschein and Allen. Edinburgh: J. Menzies, 1881.)

MISS ORMEROD and her assistants are to be congratulated on this very excellent Report, which is far more bulky than its predecessors, and correspondingly useful and interesting, and well illustrated. At the outset a very significant fact is mentioned. The season of 1880 was remarkably suitable for vegetation, and the attacks of insects consequently less severe; a high condition of vitality enabled the plants to more successfully cope with their insect enemies. The most injurious species for the year was the well-known larva of *Tipula* (daddy-long-legs), which not only attacked its more usual food, the roots of grasses, but proved itself extremely injurious to peas, so that in one field of twenty acres the prospective value in March was reduced to a realised value of only about one half in June; other crops were also attacked. Stimulating remedies, such as guano, salt, ammoniacal liquor, &c., had a good effect, but the grubs appeared to be remarkably indifferent to ordinary poisonous solutions. An experiment at the Kew Observatory as to the amount of cold they can endure showed that some survived 42° of frost. Another very injurious species was *Tephritis onopordinis* (the celery-fly); a dressing of gas-lime, unslaked lime, and soot had a good effect. The singularly misnamed *Psila rosæ* (the carrot fly) was also obnoxious; sowing the seeds in a mixture of leaf-mould, ashes, &c., proved of excellent service in this case. *Sitones lineatus* was very injurious to peas. We think Miss Ormerod acts injudiciously in calling this insect the "pea-weevil." Its larva is certainly very much given to attacking peas and many other plants, by eating the young shoots, but the true pea-weevil is *Bruchus pisi*, which destroys the peas themselves by feeding inside them. For the gooseberry saw-fly nothing proved so effectual as digging out the earth round the bushes when the larvæ and pupæ are underground, the removed portion being taken away and burnt; a suggestion that if pieces of woollen cloth be placed on the bushes the parent fly will deposit her eggs thereon seems far-fetched. Miss Ormerod has great faith in the efficacy of paraffine. In future it is proposed to extend the Report to insects not hitherto specially mentioned as desirable for observation, such as the larch-aphis and pine saw-fly. We are glad to note that the authoress has a Manual of Economic Entomology in the press.